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## NOTICE OF ALLOWANCE AND FEE(S) DUE

7590

12/05/2008

Stephen M. De Klerk  
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP  
Seventh Floor  
12400 Wilshire Boulevard  
Los Angeles, CA 90025

EXAMINER

ONTELL, KARIE AMBER

ART UNIT

PAPER NUMBER

1795

DATE MAILED: 12/05/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,265	02/19/2004	Young Nam Kim	006343.P002	7317

TITLE OF INVENTION: CARBON NANOTUBE OR CARBON NANOFIBER ELECTRODE COMPRISING SULFUR OR METAL NANOPARTICLES  
AS A BINDER AND PROCESS FOR PREPARING THE SAME

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$755	\$300	\$0	\$1055	03/05/2009

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

## HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER:** Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

# **PART B - FEE(S) TRANSMITTAL**

**Complete and send this form, together with applicable fee(s), to:** **Mail** **Mail Stop ISSUE FEE**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
**or Fax** **(571)-273-2885**

**INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

7590 12/05/2008

Stephen M. De Klerk  
 BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP  
 Seventh Floor  
 12400 Wilshire Boulevard  
 Los Angeles, CA 90025

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

## **Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,265	02/19/2004	Young Nam Kim	006343.P002	7317

**TITLE OF INVENTION: CARBON NANOTUBE OR CARBON NANOFIBER ELECTRODE COMPRISING SULFUR OR METAL NANOPARTICLES AS A BINDER AND PROCESS FOR PREPARING THE SAME**

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$755	\$300	\$0	\$1055	03/05/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
ONEILL, KARIE AMBER	1795	429-044000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.  
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev. 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 \_\_\_\_\_  
 (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 \_\_\_\_\_  
 3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee  
☐ Publication Fee (No small entity discount permitted)  
☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.  
☐ Payment by credit card. Form PTO-2038 is attached.  
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature \_\_\_\_\_

Date \_\_\_\_\_

Typed or printed name \_\_\_\_\_

Registration No. \_\_\_\_\_

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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EXAMINER

ONEILL, KARIE AMBER

ART UNIT

PAPER NUMBER

1795

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## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 428 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 428 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

**Notice of Allowability****Application No.**

10/783,265

**Applicant(s)**

KIM, YOUNG NAM

**Examiner**

Karie O'Neill

**Art Unit**

1795

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendments dated August 15, 2008.
2. ☒ The allowed claim(s) is/are 8,9,12-16,20 and 23-30.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some\* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_.

/Mark Ruthkosky/  
Primary Examiner, Art Unit 1795

**DETAILED ACTION**

1. The Applicant's amendment filed on August 15, 2008, was received. Claims 8 and 23 have been amended. Claims 1-7, 10-11, 17-19 and 21-22 have been cancelled. Therefore, Claims 8-9, 12-16, 20, and 23-30 are pending in this office action.

***Claim Rejections - 35 USC § 103***

2. The rejection of Claims 8-9, 12, 14-16, 20, 23-25 and 27-30 under 35 U.S.C. 103(a) as being unpatentable over Choi et al. (US 7,029,796 B2) in view of Dasgupta et al. (US 2003/0152835 A1 ), have been overcome based on the amendments to the claims.

***Examiner's Amendment***

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Lester Vincent on November 24, 2008.

The application has been amended as follows:

**IN THE CLAIMS:**

- In Claim 8, line 2, delete “consisting essentially of the steps of” and add “comprising” after “electrode,”
- In Claim 8, line 3, delete “by mixing” and add “consisting essentially of” before “carbon nanotubes” and add “mixed” after “carbon nanotubes”
- In Claim 8, line 10, delete “(” and add “or” before “about”
- In Claim 8, line 11, delete “)”
- In Claim 8, line 12, delete “(” and add “or” before “about”
- In Claim 8, line 13, delete “)”
- In Claim 8, line 15, delete “□” and add “°C” before “in”
- In Claim 9, line 1, delete “step”
- In Claim 12, line 1, delete “step”
- In Claim 14, line 2, delete “step”
- In Claim 15, line 1, delete “step”
- In Claim 16, line 1, delete “step”
- In Claim 23, line 2, delete “consisting essentially of the steps of” and add “comprising” after “electrode,”
- In Claim 23, line 4, add “essentially” after “consisting”
- In Claim 23, line 9, delete “(” and add “or” before “about”
- In Claim 23, line 10, delete “)”
- In Claim 23, line 11, delete “(” and add “or” before “about”

- In Claim 23, line 12, delete “)”
- In Claim 23, line 13, delete “□” and add “°C” before “in”
- In Claim 24, line 1, delete “step”
- In Claim 25, line 1, delete “step”
- In Claim 27, line 2, delete “step”
- In Claim 28, line 1, delete “step”
- In Claim 29, line 1, delete “step”

***Allowable Subject Matter***

4. Claims 8-9, 12-16, 20, and 23-30 are allowed.
5. The following is an examiner's statement of reasons for allowance:

With regard to Claim 8, the instant claims are to a process for preparing a carbon nanotube electrode, comprising: (1) preparing an electrode material consisting essentially of carbon nanotubes mixed with a binder selected from the group consisting of sulfur having an average particle size of 1 $\mu$ m or less, metal nanoparticles having an average particle size of 1 $\mu$ m or less and both of them, (2) preparing a pressed electrode material by first pressing the electrode material under a pressure from 1 to 500 atm or about 1.033 to about 516.615 kgf/cm<sup>2</sup>; and (3) subsequently pressing under a pressure from 1 to 500 atm or about 1.033 to about 516.615 kgf/cm<sup>2</sup>, or heat-treating at a temperature in the range of the melting point of the sulfur or metal nanoparticles 200°C in inert gas atmosphere, or simultaneously pressing under the said pressure and heat-treating at the said temperature in inert gas atmosphere the previously pressed

electrode material that is placed on a current collector so that the carbon nanotubes are bonded to each other and simultaneously bonded to the current collector, by the binder being bonded, deposited, or fused on the surfaces of the carbon nanotubes; wherein the binder has the effect of minimizing the internal resistance of the electrode.

With regard to Claim 23, the instant claims are to a process for preparing a carbon nanotube electrode, comprising: (1) preparing an electrode material by depositing a binder selected from the group consisting essentially of sulfur having an average particle size of  $1\mu\text{m}$  or less, metal nanoparticles having an average particle size of  $1\mu\text{m}$  or less and both of them on the carbon nanotubes, (2) preparing a pressed electrode material by first pressing the electrode material under a pressure from 1 to 500 atm or about 1.033 to about  $516.615\text{ kgf/cm}^2$ ; and (3) subsequently pressing under a pressure from 1 to 500 atm or about 1.033 to about  $516.615\text{ kgf/cm}^2$ , or heat-treating at a temperature in the range of the melting point of the sulfur or metal nanoparticles  $200^\circ\text{C}$  in inert gas atmosphere, or simultaneously pressing under the said pressure and heat-treating at the said temperature in inert gas atmosphere the previously pressed electrode material that is placed on a current collector so that the carbon nanotubes are bonded to each other and simultaneously bonded to the current collector, by the binder being bonded, deposited, or fused on the surfaces of the carbon nanotubes; wherein the binder has the effect of minimizing the internal resistance of the electrode.

The most pertinent prior art has been presented. The prior art does not teach the claimed invention. With regard to Claims 8 and 23, the closest prior art, Choi et al. (US 7,029,796 B2) in view of Dasgupta et al. (US 2003/0152835 A1 ), do not teach or fairly



suggest a process for preparing a carbon nanotube electrode comprising: preparing an electrode material consisting essentially of carbon nanotubes mixed with a binder selected from the group consisting of sulfur an average particle size of  $1\mu\text{m}$  or less, metal nanoparticles having an average particle size of  $1\mu\text{m}$  or less and both of them; preparing a pressed electrode by first pressing the electrode under a pressure from 1 to 500 atm or about 1.033 to about 516.615  $\text{kgf/cm}^2$ ; and subsequently pressing under a pressure from 1 to 500 atm or about 1.033 to about 516.615  $\text{kgf/cm}^2$  or heat treating at a temperature in the range of the melting point of the sulfur or metal nanoparticles  $200^\circ\text{C}$  in inert gas atmosphere, or simultaneously pressing under the said pressure and heat-treating at the said temperature in inert gas atmosphere the previously pressed electrode material that is placed on a current collector so that the carbon nanotubes are bonded to each other and simultaneously bonded to the current collector, by the binder being bonded, deposited, or fused on the surfaces of the carbon nanotubes.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karie O'Neill whose telephone number is (571)272-

8614. The examiner can normally be reached on Monday through Friday from 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Ruthkosky/  
Primary Examiner, Art Unit 1795

Karie O'Neill  
Examiner  
Art Unit 1795

KAO